

WHAT IS CLAIMED IS:

1. An apparatus for patterning a liquid on a substrate, said apparatus comprising:

a template having a pair of spaced-apart recessions with a protrusion disposed therebetween, with said protrusion being spaced-apart from said substrate a first distance and each of said pair of spaced-apart recessions being spaced-apart from said substrate a second distance, with said second distance being greater than said first distance; and

a source of voltage in electrical communication with said template to produce an electric field between said template and said substrate, with a strength of said electrical field being inversely proportional to said first and second distances.

2. The apparatus as recited in claim 1 wherein a difference between said first distance and said second distance defines an electric field gradient, with a portion of said electric field present between said protrusion and said substrate being greater than a subsection of said electric field present between each of said pair of spaced-apart recessions and said substrate, with said portion having sufficient magnitude to create a contiguous region of said liquid on said an area of said substrate in superimposition with said protrusion.

3. The apparatus as recited in claim 1 wherein said protrusion consists of Indium Tin Oxide (ITO).

4. The apparatus as recited in claim 1 wherein said template further includes a layer of Indium Tin Oxide (ITO) and said pair of spaced-apart recessions and said protrusion are formed in said layer of ITO.

5. The apparatus as recited in claim 1 wherein said template further includes a layer of fused silica and a layer of Indium Tin Oxide (ITO).

6. The apparatus as recited in claim 1 wherein said template further includes a layer of fused silica and a layer of Indium Tin Oxide (ITO), with said source of voltage being in electrical communication with said layer of ITO.

7. The apparatus as recited in claim 1 wherein said template is substantially transparent to ultraviolet light.

8. The apparatus as recited in claim 1 wherein said template further includes a fluorine containing monolayer.

9. The apparatus as recited in claim 1 wherein template further includes a layer of Indium Tin Oxide (ITO) and said pair of spaced-apart recessions and said protrusion are formed in said layer of ITO and further including a fluorine containing monolayer positioned adjacent to said layer of ITO, with said fluorine containing monolayer being positioned between said substrate and said layer of ITO.

10. An apparatus for patterning a liquid on a substrate, said apparatus comprising:

a template having a plurality of protrusions, each of which is spaced-apart from said substrate a first distance, and a plurality of recessions, each of which is spaced-apart from said substrate a second distance; and

a source of voltage in electrical communication with said template to produce an electric field between said template and said substrate, with a difference between said first distance and said second distance defining a plurality of electric field gradients, with a portion of said electric field present between said plurality of protrusions and said substrate being greater than a subsection of said electric field present between said plurality of recessions and said substrate.

11. The apparatus as recited in claim 10 wherein said plurality of protrusion consist of Indium Tin Oxide (ITO).

12. The apparatus as recited in claim 10 wherein said template further includes a layer of Indium Tin Oxide (ITO), with said plurality of protrusions and said plurality of recessions being present in said layer of ITO.

13. The apparatus as recited in claim 10 wherein said template further includes a layer of fused silica and a layer of Indium Tin Oxide (ITO).

14. The apparatus as recited in claim 10 wherein said template further includes a layer of fused silica and a layer of Indium Tin Oxide (ITO), with said source

of voltage being in electrical communication with said layer of ITO.

15. The apparatus as recited in claim 10 wherein said template is substantially transparent to ultraviolet light.

16. The apparatus as recited in claim 10 wherein said template further includes a fluorine containing monolayer.

17. The apparatus as recited in claim 10 wherein said template further includes a layer of Indium Tin Oxide (ITO), with said plurality of recessions and said plurality of protrusions are formed in said layer of ITO and further including a fluorine containing monolayer positioned adjacent to said layer of ITO, with said fluorine containing monolayer being positioned between said substrate and said layer of ITO.

18. The apparatus as recited in claim 10 wherein said portion of said electric field has sufficient magnitude to create a contiguous region of said liquid on an area of said substrate in superimposition with said plurality of protrusions.

19. An apparatus for patterning a liquid on a substrate, said apparatus comprising:

a template having a plurality of protrusions and recessions, spaced apart from said substrate, with said liquid being disposed therebetween;

a source of voltage in electrical communication with said template to produce an electric field between said template and said substrate, with a subportion of said electric field present between each of said plurality of protrusions being greater than a subpart of said electric field present between each of said plurality of recessions, with adjacent subportions and subparts defining an electric field gradient, with said subportions having sufficient magnitude to move said liquid to form a continuous region of said liquid between each of said plurality of protrusions and said substrate, and said electric field gradient preventing said liquid from forming a continuous area of said liquid in regions of said substrate in superimposition with each of said plurality of recessions.

20. The apparatus as recited in claim 19 wherein said template further includes a layer of Indium Tin Oxide (ITO), with said plurality of protrusions and recessions being present in said layer of ITO.

21. The apparatus as recited in claim 19 wherein said template further includes a layer fused silica and a layer of Indium Tin Oxide (ITO).

22. The apparatus as recited in claim 19 wherein said template further includes a layer of fused silica and a layer of Indium Tin Oxide (ITO), with said source